

at least one of the magnetic elements has a diameter, which is different from the diameter of at least one other magnetic element of the tag;

wherein the lengths and diameters of the magnetic elements, and the angles between them, jointly form the identity of the tag.

11. (New) A tag according to claim 10, wherein the diameters of the magnetic elements are selected from a range between 10 and 100  $\mu\text{m}$ .

12. (New) A tag according to claim 10, wherein the lengths of the magnetic elements are selected from a range between 40 and 100 mm.

13. (New) A tag according to claim 10, wherein each magnetic element is provided with a coating of dielectric material, such as glass.

14. (New) A tag according to claim 10, wherein the amorphous or nano-crystalline metal alloy of each magnetic element exhibits a Giant Magnetoimpedance-effect when exposed to electromagnetic energy of high frequency and magnetic energy of lower frequency.

15. (New) A tag according to claim 10, wherein the amorphous or nano-crystalline metal alloy of each magnetic element has a majority ratio of cobalt.

16. (New) A tag according to claim 10, wherein the composition of the amorphous or nano-crystalline metal alloy of each magnetic element is  $(\text{Fe}_{0.06}\text{Co}_{0.94})_{72.5}\text{Si}_{12.5}\text{B}_{15}$ .

17. (New) A method of encoding an identity code into an electronic article identification tag having a plurality of magnetic elements, said identity code comprising a plurality of words at respective positions in a numeral system, each word being capable of storing one of  $n$  different values, comprising

providing a first set of lengths for magnetic elements;

providing a second set of diameters for magnetic elements;

forming a third set of element types by associating one unique length among said first set of lengths, and one unique diameter among said second set of diameters, with each respective element type,

mapping each of said  $n$  different values to a respective element type;

providing a fourth set of angular positions for magnetic elements;

arranging in said tag, for each word in said identity code, a magnetic element of the type corresponding to the value of the word, at one angular position among said fourth set of angular positions.

18. (New) An article identification apparatus, where an individual article is provided with a tag comprising a plurality of angularly arranged magnetic elements, the apparatus comprising transmitter means for transmitting a first electromagnetic signal in a detection zone; receiver means for receiving a second electromagnetic signal, generated by the tag in response to the first electromagnetic signal from the transmitter means; modulating means for generating a magnetic field for modulating the second electromagnetic signal during the generation thereof by the tag; demodulating means for producing a reply signal by demodulating the second electromagnetic signal as received by the receiver means; and a controller operatively connected to the demodulating means; wherein

the modulating means is arranged to generate a magnetic modulating field having a rotating orientation, wherein the controller is arranged to detect when a frequency shift occurs for the reply signal and in response determine an angular position of an individual magnetic element;

the modulating means is arranged to generate a magnetic modulating field with increasing amplitude, wherein the controller is arranged to determine a corresponding change in amplitude of the reply signal and in response determine a length of said individual magnetic element;

the modulating means is arranged to generate a magnetic modulating field with increasing amplitude, wherein the controller is arranged to continuously monitor an amplitude of the reply signal so as to detect a saturation point thereof and in response determine a diameter of said individual magnetic element; and